

- amount of transglutaminase to said total surface area of the curd or cheese segments,
- c) pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and
  - d) allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments.

18. The process of claim 17 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40<sup>o</sup>F and 125<sup>o</sup>F.

#### SUMMARY OF THE REJECTION

Claims 1-16 are rejected under 35 USC 102(b) As Anticipated by Kuraishi et al., U.S. Patent No. 5,681,598

It is asserted that U.S. Patent No. 5,681,598 (Kuraishi et al.) teaches a process for producing cheese using transglutaminase after cheese formation, and using the transglutaminase in the amounts claimed.

#### RESPONSE TO THE REJECTION

The rejection under 35 USC 102(b) over Kuraishi et al. is respectfully traversed. The fundamental difference between the practice of the invention and the disclosure of Kuraishi with regard to the use of transglutaminase (TG) may be summarized as follows:

Kuraishi Process	Claimed Process	Comments
Curd is cooked and stirred in aqueous system	Solid curd segments are coated with	The invention process places TG on curd

in presence of TG (column 7, lines 7-34)	transglutaminase	surface rather than being imbibed in curd
Liquid (including TG) is drained from curd, reducing concentration of TG	TG must remain on curd segments during process in applied concentration	Removal of TG removes bonding capability of TG on curd segments
Curd subsequently cut again after TG treatment and drainage of liquid with TG therein	Curd segments are pressed in presence of TG	Recutting removes Tg from surface during subsequent pressing process
Pressing is done after TG has reacted and after residual TG drained with whey	Pressing must be done in presence of TG to effect bonding	TG cannot bond segments during pressing in Kuraishi as the TG has been removed or reacted
The weight gain in Kuraishi (column 7) appears to be due to reaction of curd with protein in other material in the aqueous matter. There is no bonding of solids with TG to form smooth cheese form	The TG bonds cheese curd segments together at the surface of adjacent curds. The TG must be present during pressing to effect the smooth bond	There is little (less than recited amount) of TG present on surface of curd segments in Kuraishi during pressing step. TG liquid drained, and curd recut to expose new surfaces before draining.

As can be seen from this side-by-side comparison, there are substantial and fundamental differences between the invention as claimed by Applicant and the disclosure of Kuraishi. There is no intention or inherent use of transglutaminase (TG) by Kuraishi to bond segments of curd protein. The treatment by Kuraishi reacts the TG well before pressing, drains TG from the mass prior to pressing, cuts the intermediate curd before pressing, and does not add TG to coat the cut surface of the TG before pressing.

Both the original claims (and as amended) and the new claims 17-18 clearly recite that the transglutaminase must be present on the surface of the curd or cheese segments during pressing, and that the TG effects bonding between the segments. These steps are not possible in the practice of the Kuriashi process. As noted above, the curd is stirred and heated in the presence of TG, bonding the TG to surfaces, without bonding segments together. The liquid, along with any residual TG, is then drained from the curd mass. The curd mass, after draining, but without pressing, is then cut again into smaller pieces and further drained. The drained smaller segments are then milled (broken into

small pieces again), mixed with salt, and then pressed. This process clearly does not and cannot provide TG on the surface of curd segments in the concentration required at the time of pressing. Kuraishi clearly does not anticipate the invention as claimed.

It is equally obvious that the purpose of the addition of the TG in the process of Kuraishi is to build up mass that cannot be drained during initial steps, and that the TG serves no purpose after formation of the original curd mass (that is not and has not been pressed). It would not be obvious to one skilled in the art to destroy the function of Kuraishi to build up mass during curd development and add TG for no functional benefit described in the art at the later step, with a different purpose, as recited in the claims. There would be no rational or reasoned basis for asserting that the claims are obvious under 35v USC 103(a) over Kuraishi.

It is also to be noted that claims 5, 8 and 18 recite process conditions that are not taught by Kuraishi. The example shows a maximum of 38OC during the aging process, and no elevated temperature during pressing. These claims are also clearly novel and unobvious over Kuraishi.

The rejection is in error and must be withdrawn. The Examiner is courteously invited to call the Attorney signing below at **952.832.9090** to advance the prosecution of the Application if any issues might be resolved by a telephone interview.

Respectfully submitted,  
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Date: July 26, 2002

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Letter is being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: U.S. Patent and Trademark Office, Assignment Division, Box Assignments, CG-4, 1213 Jefferson Davis Hwy, Suite 320 Washington, D.C. 20231 on July 26, 2002.

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**CLEAN COPY OF THE AMENDED CLAIMS IN COMPLIANCE WITH 37  
C.F.R. 1.121**

- A1
1. A process for the structuring of a cheese portion comprising:  
providing portions of curd or cheese in segments of a first average dimension and having a total surface area,  
adding to said segments a composition comprising transglutaminase to at least five percent of said total surface area of said segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area,  
pressing said portions together, while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, to eliminate air between said portions while forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese,  
allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese.

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4. The process of claim 1 wherein said composition comprises transglutaminase with less than 10% by weight of said transglutaminase composition with respect to cheese protein.

- Rule 12<sup>b</sup>
- A3
7. A process for the structuring of a cheese portion comprising:  
breaking a single curd portion having a weight of between 2 and 40 kilograms into smaller segments of curd;  
adding a composition comprising transglutaminase to said smaller segments of curd in an amount of transglutaminase sufficient to chemically bond said smaller segments of curd together,  
pressing said segments of curd together, while the amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd segments to eliminate air between said segments while forming a volume of curds that is larger than 50 kilograms, and

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allowing said transglutaminase to bond said segments of curds together.

17. A process for the structuring of a cheese portion comprising the following

steps in sequence:

- a. providing portions of curd or cheese in segments of a first average dimension and having a total surface area,
- b. adding a composition comprising transglutaminase to at least five percent of said total surface area of the curd or cheese segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments,
- c. pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and
- d. allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments.

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18. The process of claim 17 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40° F and 125° F.